

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (*Currently Amended*) A vibration isolation system for at least partially damping and isolating vibrations of a body, the system comprising:

a plurality of sensors mechanically coupled to the body configured to detect vibrations of the body;

a plurality of active isolator devices mechanically coupled to the body; and

a control system ~~configured to control~~ coupled to the active isolator devices; ~~wherein the control system is configured to that:~~

(a) correlates vibrations measured in a first coordinate system with vibrations in modal directions based on natural modes or eigenmodes of the body,

wherein the natural modes or eigenmodes of the body depend on physical characteristics of the body and the body's coupling to an environment, and are defined by the directions in which the body naturally vibrates;

~~transform~~ (b) transforms vibrations measured in a first coordinate system of the plurality of sensors into vibrations in modal directions, that comprise a second coordinate system, corresponding to the natural modes or eigenmodes of the body[.];

~~wherein the natural modes or eigenmodes of the body depend on physical characteristics of the body and the body's coupling to an environment;~~

~~determine~~ (c) determines a modal compensation signal for each modal direction;

~~transform~~ (d) transforms each modal compensation signal into an active isolator control signal in the first coordinate system for each active isolator device; and

~~stabilize~~ (e) stabilizes at least one unstable natural mode of the body.

2. *(Previously Presented)* The system of claim 1, wherein the at least one unstable natural mode stabilized by the control system is directed substantially vertically.
3. *(Previously Presented)* The system of claim 1, wherein the body is positioned on a base frame by air mounts.
4. *(Previously Presented)* The system of claim 1, wherein a passive isolator device and an active isolator device engage the body at the same location on the body.

5-25. *(Canceled)*